

Method of Test For
WATER SUSCEPTIBILITY OF ASPHALTIC CONCRETE MATERIALS
DOTD DESIGNATION: TR 317-14

Scope

1. This method of test describes the procedure for qualifying anti-strip additives to be incorporated into the asphalt cement to be used in asphaltic mixtures. The additives are proportioned in an asphaltic-additive mixture at a rate of 0.5 percent by weight of asphalt cement.
2. Reference Documents
 - A. DOTD **TR 610** – Infrared Spectrophotometric Analysis
 - B. ASTM D3625 – Effect of Water on Bituminous-Coated Aggregate Using Boiling Water
 - C. DOTD TR **3xx** – Asphalt Volumetric Calculations

Apparatus

1. Use ASTM D3625, Section 5-APPARATUS with the following modifications
 - A. Oven – of constant temperature, capable of maintaining a temperature of $160 \pm 3^{\circ}\text{C}$ ($325 \pm 5^{\circ}\text{F}$)
 - B. Balance – having a minimum capacity of 200g and sensitive to 0.1g
 - C. Containers – disposable, approximately 0.5 L ($1\frac{1}{4}$ pint) (No.2) metal containers and friction top liter (quart) and four-liter (gallon) metal containers
 - D. Sheet aluminum or Heavy Duty Aluminum Foil – approximately 0.5 m by 0.5 m (1.5 ft by 1.5 ft) or of sufficient size to accommodate the aggregate-asphalt mixture
2. Form – Anti-Strip Additive Worksheet

Health Precautions

Proper precautions are to be taken whenever hot materials or equipment must be handled. Use container holder or thermal gloves while handling hot containers. Wear eye protection while stirring and weighing heated materials due to possible shattering of particles. Dry contaminated materials under a vent to prevent exposure to fumes.

Sample Identification

An infrared spectrophotometric analysis of the anti-strip additive will be performed in accordance with DOTD **TR 610** for the purposes of permanent identification.

Sample

1. Prepare a mixture as follows, using the anti-strip additive with each reference asphalt and combined with each reference aggregate
 - A. Heat the asphalt cement until it is readily pourable, approximately 135°C (275°F), but not to exceed 175°C (350°F)
 - B. Pour 50.0g of asphalt cement into a clean tared liter (quart) can
 - C. Add 0.5g of additive
 - D. Pour an additional 50.0g of asphalt cement into the mixture
 - E. Transfer the mixture from the balance to the hot plate and, while stirring, return the material to 135°C (275°F).
 - F. Place a friction top loosely on the liter (quart) can (being careful not to seal the can); put the liter (quart) can inside an empty four liter (gallon)

can; and place a perforated friction top on the four-liter (gallon) can.

- G. Put the four-liter (gallon) can in an oven operating at $160\pm 3^{\circ}\text{C}$ ($320\pm 5^{\circ}\text{F}$) for 24 ± 2 hours.
- H. Place 95.0g of oven dried unwashed aggregate into a clean 0.5 L mixing can and put the can in the oven operating at $160\pm 3^{\circ}\text{C}$ ($320\pm 5^{\circ}\text{F}$) for 1 to $1\frac{1}{2}$ hours.
- I. Remove both containers from the oven. Add 5.0g of the asphalt-additive mixture to the aggregate container. Mix thoroughly so that all aggregate surfaces are coated.
- J. Immediately empty the aggregate-asphalt mixture onto a clean piece of aluminum sheeting and allow cooling at room temperature for 2 hours \pm 5 minutes.

Normal test reporting time is 2 days.

Procedure

- 1. Use ASTM D3625, Section 7, PROCEDURE with the following modifications
 - A. Use the prepared sample
 - B. Allow three laboratory personnel to visually determine the percent coating without manipulating the sample in any way

Calculations

- 1. Calculate the average rating of each combination to the nearest 1%.
- 2. Calculate the percent visible surface area coated with asphalt to the nearest 1%.

Report

- 1. Report the retained asphalt coating to the nearest percent.

Normal Test Reporting Time